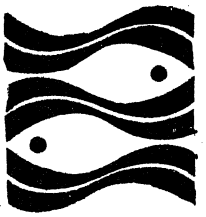

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THE EEL STOCKS OF THE SHANNON SYSTEM AND PROSPECTS FOR THE DEVELOPMENT OF THE FISHERY

by

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Lough Neagh has long been known to yield the greatest quantities of eels of any water body in Ireland, the annual catch being in excess of 700 tonnes. The Shannon catchment on the other hand yields less than 100 tonnes per annum. This Leaflet describes work carried out in Lough Neagh and in the Shannon catchment in 1985 and 1986 which has indicated that eels are now more abundant in the Shannon System than in Lough Neagh. The implications are that the stocks in the Shannon System are sufficient to yield an annual catch of as much as 1,000 tonnes and value £2 million.

The current capital cost of establishing a two-man crew capable of catching 3 tonnes of eel, value £6,000, is £2,500. Annual running costs per crew are less than £1,000. The large scale exploitation of the fishery would involve much more substantial investment by the owners. Arising from this paper, the Department has raised the matter with the ESB and the Shannon Regional Fisheries Board to agree on a strategy to maximise employment from the fishery.

The small size and value of the Shannon fishery was attributed to the drastic reduction in the ascent of elvers which followed the building of the dam at Ardnacrusha in 1930. A study of the eel stocks made by fyke netting in 1969 and 1970 supported this view.

In 1959 overland transport of elvers in the Shannon System began and has continued without a break. Since few eels of less than ten years old are taken in the fyke nets used in the study, the results in 1969 and 1970 gave an indication of the stock density before elver transport could have influenced it. Subsequent sampling in Lough Derg yielded enhanced catches and indicated that the stock size was increasing.

However, in spite of increased effort in trapping the silver eels, the total catch for the system did not increase to the degree expected. While work had been in progress in sampling the yellow eels in Lough Derg on an annual basis since 1979, no extensive investigation of the eels elsewhere in the Shannon catchment had been undertaken since 1970 and no records were available for catch per unit effort in Lough Neagh. Accordingly, in 1985 and 1986 samples were taken in Lough Neagh, using identical gear to that in Lough Derg and in 1986 the Shannon was sampled as far upstream as Lough Bofin.

The results of the two surveys, given in detail in this Leaflet, were remarkable and have led to a need to reassess eel management policy on the Shannon. In brief, the stock density in the Shannon appeared to be at least double that of Lough Neagh, perhaps three of four times as large. The only reasonable conclusion from the results is that the fishing effort on the Shannon is too small to exploit the eel stocks adequately.

METHODS

Trains of "summer fyke nets", each comprising a pair of funnels, length 3m, joined mouth to mouth by a leader of length 8m, overall length 14m, were set daily and fished on the morning after setting. Each train consisted of ten nets except on a few occasions in Lough Neagh when smaller numbers were used.

In Lough Neagh the site at Three Islands was selected on the basis of local opinion that it should yield a good catch. Shallow water in Traad Bay was sampled to confirm the belief that few or no eels frequent water less than 1m in depth. The other positions were chosen at random over each of the three available substrates of sand, mud and stone.

On the Shannon, Lough Bofin, Coosan and Portumna were chosen to repeat samples taken in 1970. In Lough Derg two sites were deliberately chosen to find water deeper than 10m, the others were taken at random.

RESULTS

In both years the Three Islands site yielded the expected high catch, 167 and 118 eels in ten nets respectively (Table 1). The substrate there is stony and considered to be the most attractive to Lough Neagh eels. The other sites were in regions where professional eel fishermen operate their long-lines and yielded varying but small catches. No eels were caught in the shallow water in Traad Bay, although chironomid larvae were abundant in the mud there.

The highest catch in Lough Derg, of 206 eels, was considerably greater than the highest in Lough Neagh and all but two of the 15 Lough Derg catches were greater than the random Lough Neagh catches. The two small catches in Lough Derg were made in deep water, at 14m.

In general the catches on the Shannon upstream of Portumna were similar in size to the majority of the Lough Neagh catches. An outstanding exception was the catch of 466 eels in Lough Ree, 1 km south of Lanesborough, the greatest ever made in an Irish lake since the programme of sampling by fyke net began in 1967. The only small catch, of nine eels, was made in Coosan Lough, a blind offshoot to the main Lough Ree.

The mean catch per net for Lough Neagh was 4.8, and, for the Shannon 8.47. This indicates a substantially greater stock in the Shannon. For a better comparison, however, the sites which were not selected at random should be omitted, namely Three Islands, and Traad Bay in Lough Neagh and Coosan Lough, Portumna and the two deep water sites in Lough Derg. This gives means of 2.1 for Lough Neagh and 10.5 for the Shannon. Since it is very unlikely that Lough Neagh eels react to the fyke nets in a different manner from those on the Shannon, the greater catch in the Shannon must be taken to indicate greater stocks.

DISCUSSION

Age determinations of yellow eels from Lough Neagh and Lough Derg in 1985 have been made by Ms Ann Marrion and Ms Fiona Malone respectively. They show that the growth rates of eels in the two systems are similar. Most of the eels of marketable size are between 10 and 20 years of age. With the same growth rate in both cases, the catch per hectare in the Shannon System should be greater than that of Lough Neagh. The surface area of Lough Neagh is roughly equal to that of the lakes in the Shannon System and therefore the eel yield of the whole watercourse should be greater than that of Lough Neagh, not about one tenth of its value.

Since the elver stocking operation of the ESB has raised the Shannon eel stocks to a figure in excess of that for Lough Neagh, other explanations must be sought for the discrepancy in catches. Two factors may be considered.

The fishing rights of the entire Shannon system are vested in the Electricity Supply Board. In 1968 the traditional fishermen agreed to cease fishing for yellow eels. Since then, yellow eel fishing on the Shannon has taken place at a very low rate. In 1984 the ESB itself began to exploit the yellow eels by fyke net, confining the effort to two boats. The yield is less than 6 tonnes per annum.

It is unlikely that long-lines or fyke nets in sufficient numbers to make a major catch could proceed for long without detection, since servicing the gear takes a number of hours and cannot be easily concealed. While poaching is known to take place, it is not considered to have any noticeable effect on the stocks.

The yellow eel yield in Lough Neagh on the other hand from 1976 to 1985 has varied between 454 and 806 tonnes, taken by licensed fishermen. The fact that this is a sustainable yield is borne out by the recording of the highest ever catch as recently as 1984 and by the presence of many large eels in the catches.

The second factor is less clearly defined but may reflect a more efficient silver eel trapping system. The Lough Neagh yield of silver eels is more than double that of the Shannon and has varied between 137 and 340 tonnes from 1976 to 1985. The Lough Neagh fishery at Toome uses, as does the Killaloe fishery, a barrage of coghill nets and allows a ten percent free gap. However, the gaps in which the Toome nets operate are closed by a metal grid when the nets are raised for fishing. This cannot be done at Killaloe and eels can move freely through the gaps in the course of the 15 minutes or more required to raise and empty each group of nets. Furthermore, the mesh at the mouth of the Killaloe nets is large enough to allow all male eels and the smaller females to pass through. At high floods the water of the Shannon passes over the nets. The Killaloe nets therefore cannot catch all the eels migrating and are likely to be much less efficient than those at Toome.

The inefficiency of the Killaloe nets has been clearly demonstrated by the success of the system of nets installed downstream of them at Clonlara. These make substantial catches, in spite of the fact that they cover only 9% of the cross-sectional area of the watercourse.

CONCLUSIONS

It is certain that the catch at Killaloe can be greatly increased by completing the work of installing an hydraulic system for raising the nets. However, to judge from the Lough Neagh experience, there is an upper limit in the order of 300 tonnes per annum to the catch which an eel weir of this kind can achieve. In addition to modifications at Killaloe, therefore, other sites for the capture of the silver eels should be established.

Secondly, in spite of the apparent efficiency of the Toome weir the annual silver eel catch is only 30% of the total yield of Lough Neagh. There is no evidence that the intensity of the yellow eel fishery has an adverse effect on the silver fishery. Indeed, the maximum silver eel catch came in the autumn of 1979 following the maximum yellow eel catch on record at the time.

The results of fyke netting observations therefore suggest that the annual yield of the Shannon eel fisheries should be over 1,000 tonnes. This can be achieved partly by improving and increasing the number of silver eel fisheries and partly by developing the yellow eel fishery. The quality of Shannon eels is excellent and revenue for the region should be over £2 million.

Table 1. Numbers of eels caught in fyke net trains in Lough Neagh

Date	Site	Depth (m)	Number of nets	Number of eels	Estimated weight (kg)	Eels per net
1985						
31.7	Three Islands	1-6	10	167	21.3	16.7
1.8	Russel's Point	3-5	10	19	2.0	2.4
2.8	Toome Bay	14-15	10	6	0.6	0.6
1986						
22.7	Three Islands	1-6	10	118	15.0	11.8
22.7	Russel's Point	8-12	5	8	0.8	1.6
23.7	Ellis's Cut	2-3	10	36	3.9	3.6
23.7	Tolan's Flat	3-4	5	13	1.4	2.6
24.7	Traad Pier	2-3	4	25	2.7	2.5
24.7	Toome Bay	14-15	6	6	0.6	1.0
25.7	Traad Bay	1	5	0	0	0
25.7	Traad Point	1-3	10	8	0.8	0.8

Table 2. Numbers of eels caught in trains of ten fyke nets in southern Lough Derg.

Date	Site	Depth (m)	Number of eels	Estimated weight (kg)	Eels per net
1985					
25.7	West of Hobert	3-4	41	6.1	4.1
26.7	Ringalough	3-4	127	18.8	12.7
5.9	Hare Island	3-4	112	16.6	11.2
7.9	Ringalough	3-4	125	18.5	12.5
1986					
21.6	Clery's Point	1-3	119	17.6	11.9
10.7	Ringalough	3-4	206	30.5	20.6
10.7	East of Hobert	3-4	61	9.0	6.1
11.7	Off Ringalough	14	8	1.2	0.8
11.7	Church Bay	3-4	133	19.7	13.3
12.7	Off Ringalough	14	2	.3	0.2
24.9	Ringalough	3-4	60	8.9	6.0
25.9	Hare Island	1-7	78	11.6	7.8
25.9	Hare's Gap	2-4	69	10.2	6.9
26.9	Clery's Point	1-3	42	6.2	4.2
26.9	Hobert	2-8	61	9.0	6.1

Table 3. Numbers of eels caught in trains of ten fyke nets in Shannon river and lakes.

Date	Site	Depth	Number	Estimated weight (kg)	Eels per net
1986					
17.8	Shannon at Portumna	5-6	24	3.5	2.4
18.8	Shannon at Athlone	2-3	34	5.0	3.4
19.8	Lough Ree, Lanesborough	1-4	466	69.1	46.6
20.8	Lough Bofin	2-3	30	4.4	3.0
21.8	Lough Ree, Coosan	3-4	9	1.3	0.9
22.8	Lough Derg, Portumna	2	35	5.1	3.5
23.8	Lough Derg, Portumna	2	23	3.4	2.3